

IN THE DRAWINGS

Please replace Figures 1-9B with the amended version included herewith.

REMARKS

Claims 1, 3, 5, 6, 8 and 10 are pending in the application. Claims 2, 4, 7 and 9 are canceled.

The drawings are objected to by the Examiner. Figures 1 and 2 are amended to provide descriptors for items 310 and 400. Figures 3A, 3B, 7A, 7B, 9A and 9B are amended to be larger and clearer.

Figure 7A is objected to as the Examiner states that reference numerals 860 and 870 designate the same filter. Applicant respectfully disagrees. Filter 870 designates a filter having the components of filter 860, but also including an averaging device Av. Applicant respectfully requests reconsideration and withdrawal of this objection to Figure 7A.

Figure 7B is objected to as the Examiner states that reference numerals 865 and 875 designate the same filter. Applicant respectfully disagrees. Filter 875 designates a filter having the components of filter 865, but also including an averaging device Av. Applicant respectfully requests reconsideration and withdrawal of this objection to Figure 7B.

Regarding Figures 4-6, Applicant notes that English translations of labels are currently provided with each of Figures 4-6. Nonetheless, Figures 4-6 are amended to replace the foreign language labels with English labels.

The specification is objected to for various informalities. The specification is amended to overcome the Examiner's objections, as shown in the enclosed substitute specification. Specifically, amendments to the text were made per the Examiner's suggestions, the formulae were replaced with formulae having larger and clearer

characters, and the tables were replaced with tables that do not include any non-English labels. No new matter was included in the specification as a result of these amendments.

Claims 1-10 are objected to for having a variety of informalities. Claims 2, 4, 7 and 9 are canceled. Claims 1, 3, 5, 6, 8 and 10 are amended to overcome the objection.

Claims 6 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Claim 6 is amended to overcome the rejection. Applicant respectfully requests that the section 112 rejection of claims 6 and 7 be reconsidered and withdrawn.

Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,808,463 to Nagano, hereinafter "Nagano". Claims 2 and 4 are canceled. Claims 1 and 3 are independent. Applicant respectfully traverses this rejection.

Claim 1 provides a vector-detecting apparatus that detects an in-phase component and a quadrature-phase component of a pre-determined frequency signal. The apparatus includes a first filter, and a second filter whose impulse response is orthogonal to said first filter. An output of the first filter is regarded as the in-phase component of the pre-determined frequency signal, and an output of the second filter is regarded as the quadrature-phase component of the pre-determined frequency signal. An impulse response of the first filter is weighted by a sine function of the frequency of the pre-determined frequency signal, and an impulse response of the second filter is weighted by a cosine function of the frequency of the pre-determined frequency signal. The first filter and the second filter are digital filters, and the impulse response of each of the first filter and the second filter has a natural number that is a multiple of one period of said pre-determined frequency signal.

Nagano discloses a measurement apparatus for measuring a leakage power of an adjacent channel of a transmitting channel, of a device under test (DUT) 1 (col. 4, lines 63-67). The DUT 1 produces a transmitting signal, and measurement apparatus executes a complex FFT (fast Fourier transformation) using a digital signal processor (DSP) 4 to measure the adjacent channel power (col. 5, lines 1-5).

DSP 4 performs digital signal processing for a digital signal 211 supplied from an A/D convertor 3 (col. 5, lines 17-19). Within the DSP 4, a quadrature detector (orthogonal detector) 400 performs quadrature detection of signal 211 and outputs an in-phase component I and a quadrature component Q, and digital low-pass filters 405 and 406 remove the high frequency components from the in-phase component I and the quadrature component Q (col. 5, lines 30-37). Within the quadrature detector 400, signal generators 402 and 404 and multipliers 401 and 403 are provided (col. 5, lines 53-54). The generators 402 and 404 generate digital values of a cosine signal and a sine signal every sampling, respectively, the cosine and sine signals having a same frequency f_H (col. 5, lines 54-57). The multipliers 401 and 403 multiply the cosine signal and the sine signal with the digital signal 211 supplied to the quadrature detector 400, respectively (col. 5, lines 57-60). An output signal 212 of the multiplier 401 indicates the in-phase component and is input to the low-pass filter 405, and an output signal 213 of the multiplier 403 indicates the quadrature component and is input to the low-pass filter 406 (col. 5, lines 60-64).

Nagano discloses extraction of the in-phase and quadrature components of a signal. However, Nagano does not disclose this extraction solely with two filters. Nagano requires the use of both multipliers 401 and 403, as well as low-pass filters 405 and 406, to extract the in-phase and quadrature components. In contrast, the present invention only requires the use of two filters to extract these components, which reduces the required signal processing time as compared to Nagano.

Furthermore, Nagano does not disclose a first and second digital filter, where the first filter's impulse response is weighted by a sine function of the frequency of the signal and an impulse response of said second filter is weighted by a cosine function of the frequency of the signal, and the impulse response of each digital filter has a natural number that is a multiple of one period of the signal.

Therefore, Nagano does not disclose or suggest an apparatus having a first and second filter, "wherein an impulse response of said first filter is weighted by a sine function of the frequency of the pre-determined frequency signal and an impulse response of said second filter is weighted by a cosine function of the frequency of the pre-determined frequency signal, and wherein said first filter and said second filter are digital filters, and said impulse response of each of said first filter and said second filter has a natural number that is a multiple of one period of said pre-determined frequency signal," as recited in claim 1. Thus, Nagano does not disclose or suggest the elements of claim 1. Accordingly, claim 1 is patentable over Nagano.

Claim 3 includes recitals similar to claim 1. For at least reasoning similar to that provided in support of the patentability of claim 1, claim 3 is patentable over Nagano.

Claim 5 depends from claim 3. For at least reasoning similar to that provided in support of the patentability of claim 3, claim 5 is patentable over Nagano.

For the reasons set forth above, it is submitted that the rejection of claims 1-5 under 35 U.S.C. 102(b) as anticipated by Nagano is overcome. Applicant respectfully requests that the rejection of claims 1-5 be reconsidered and withdrawn.

Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagano in view of U.S. Patent No. 4,888,701 to Wakasugi et al., hereinafter "Wakasugi". Claims 6 and 8 are independent. Claims 7 and 9 are canceled. Applicant respectfully traverses this rejection.

As described above in the discussion of claim 1, Nagano does not disclose or suggest an apparatus having a first and second filter, "wherein an impulse response of said first filter is weighted by a sine function of the frequency of the pre-determined frequency signal and an impulse response of said second filter is weighted by a cosine function of the frequency of the pre-determined frequency signal, and wherein said first filter and said second filter are digital filters, and said impulse response of each of said first filter and said second filter has a natural number that is a multiple of one period of said pre-determined frequency signal," as recited in claim 1. Thus, Nagano does not disclose or suggest the elements of claim 1.

Applicant does not believe that Wakasugi makes up for the deficiencies of Nagano, as it applies to claim 1. Accordingly, Applicant submits that claim 1 is patentable over the cited combination of Nagano and Wakasugi.

Claims 6 and 8 include recitals similar to claim 1. For at least reasoning similar to that provided in support of the patentability of claim 1, claims 6 and 8 are patentable over the cited combination of Nagano and Wakasugi.

Claim 10 depends from claim 8. For at least reasoning similar to that provided in support of the patentability of claim 8, claim 10 is patentable over the cited combination of Nagano and Wakasugi.

For the reasons set forth above, it is submitted that the rejection of claims 6-10 under 35 U.S.C. 103(a) as being unpatentable over Nagano in view of Wakasugi is overcome. Applicant respectfully requests that the rejection of claims 6-10 be reconsidered and withdrawn.

An indication of the allowability of all pending claims by issuance of a Notice of Allowability is earnestly solicited.

Respectfully submitted,

Date: _____

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